



Solving real-world vehicle routing problems in uncertain environments

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Résumé en anglais This is a summary of the Ph.D. thesis defended by the author in December 2009 at École des Mines de Nantes and Universidad de los Andes in Bogotá. The thesis was advised by Christelle Guéret and Andrés L. Medaglia and co-advised by Bruno Castanier and Nubia Velasco. The manuscript is written in English and it is available from the author upon request. The focus of the dissertation is to study real-world vehicle routing problems (VRPs) in uncertain environments. First, the thesis proposes a set of new methods for the VRP faced by a public utility and reports how these methods were embedded into a decision support system. Second, the thesis introduces a stochastic VRP widely found in practice but never studied in the literature before: the multi-compartment VRP with stochastic demands (MC-VRPSD). To solve the problem the dissertation proposes a set of solution methods that offer different tradeoffs between accuracy, speed, simplicity and flexibility. Lastly, the thesis proposes two multiobjective approaches to address the risk behavior of decision makers towards the cost spread in stochastic routing problems and applies them to the MC-VRPSD.

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